But proofs of their increase are the hundreds of new villages tilled by Kurds and built by them in the regions of Kubur el Bid, Amuda, and Derbassiya.

The Kurds like the Arabs, follow a tribal organization. Starting from the east, the Koshar tribe, mostly nomadic but recently turning to agriculture, dominates Jazirat ibn Amr, i.e., the region of Deink and Ain Diwar. The Koshar border Shammar on the south and they are on fighting terms because Nayefz Pasha, chief of the Koshar, killed the brother of Dham, chief of Shammar. Next to the west is the Shitiya tribe around Kubur el Bid. This tribe is old in the region. Its members are Arab in their dress and, in contrast with all the other Kurdish tribes, they speak Arabic as well as Kurdish. Its lands lie west of Shammar and more within the Tay region but its relations with both are friendly.

Qamishli, which is a Tay region, includes villages of the Pinar Ali tribe. But west of Qamishli comes a solid bloc of 100% Kurdish villages extending for more than sixty kilometers and reaching to the west of Dirbassiya practically uninterrupted by any Arab village. This area is undoubtedly one of the most fertile of Jazirah. Within it, the Dakkuriya tribe is centered around Amuda, then follow the Kikiya around Dirbassiya, and the Milliya from Dirbassiya to Ras el Ain.

The Kurds are considered very good farmers. They plow and plant with mules but they rent combines for the harvest. This is because they have learned that combine harvest is more economical. The Kurd is also greatly praised for his character. He is truthful, honest, and upright in his dealings. He keeps his word and the merchants of the Jazir trust him completely. He is also clean in his home and in his dress, and though Bedouins reproach him for not being generous in his house, his standard of living is higher than the Bedouin and his villages are much cleaner.

The Kurds owe allegiance to their Agha who takes the place of the Bedouin Sheik. But this relationship is weaker than is the case of the Bedouins. The successive Governments did not give the Agha grants of money or similar authority over his tribesmen in the manner of the Sheik. The Kurds were considered from the start sedentary people subject directly to Government laws. That is why most of the Kurds own and till their lands in their own right.

III The Shashans

The Shashans, a Circassian tribe around Ras el Ain, complete the rural population of Jazirah. They migrated to Syria during the Ottoman rule and settled as mercenary soldiers. They are not good at agriculture and their lands are not fertile and do not compare with those of the Kurds.

IV. The Christians

The cities and commercial centers of Jazirah are an extra-ordinary mixture of races and creeds, but they are perhaps more than 80% Christian. This is true of Kubur el Bid, Qamishli, Amunda, Dirbassiya and Hassakeh.

As in the case of the Kurds, the Turkish massacres of the Christians in Mardin and the mountainous country around it started their migration to Jazirah. The Christians reached Jazirah without property or capital with which to begin. They settled mostly in the towns mentioned. A few of them already owned lands, others were traders and had previous relations with the Bedouins and Kurdish tribes. In a relatively short time the towns grew and flourished. The Christinas prospered from commerce before the expansion of agriculture. The tariff differences between Syria and Turkey on such important commodities as sugar, tea, and coffee and the intermingling of the Kurdish population on both sides of the frontier, made the Jazirah towns ideal for an extensive smuggling business.

The town Christians also served as middlemen to the merchants of Aleppo, who provided the money to lend to the Bedouins and Kurds or to buy the sheep, cattle and crops. This work on a commission or partnership basis coupled with the smuggling business proved profitable to the merchants of Jazirah, so that during the last twenty years many of them have become wealthy and have come to own real estate and agricultural lands and machinery without, however, abandoning their commercial activities with the merchants of Aleppo. In fact, the general prosperity and development of Jazirah has increased its need for the credit of Aleppo.

This picture of the Christian population of Jazirah is not complete without mention of the Christian peasants who migrated from the mountain villages and settled in the country. Though Christian and living in villages 100% Christian, some of them are Kurdish in their language, dress and customs. Some other villages are populated

7:Lewis S-5 (ca. 1940-45) 1948 MD1 Syria MD1

IS ONE WHERE DESERT MERGES INTO THE SOWN. THE REGION

regimen is Mediterranean in type, practically all the precipitation falling in winter, the summer being characterized by drought and great heat. In the east the rainfall is sporadic and unreliable and in most years is less in total quantity than in the west. Selemiya has a mean annual rainfall of 344 millimeters (13.5 inches). On the west-facing slopes of Jebel Bil'as rainfall is relatively heavy, though highly variable, and it permits tree growth. The present eastern limit of close agricultural settlement and of permanent unirrigated cultivation is near the 200-millimeter isohyet;* it was approximately the same in Romano-Byzantine times. Any further extension of agriculture to the east would mean great risk of crop failure and of increased soil erosion by wind and water.

In the cultivated west the soil is heavy and clayey, but farther to the east it is light and friable, with a high sand content and practically no humus. In Jebel Bil'as the soil is intermediate between these two types, liable to erosion by wind in summer and water in winter.

Over the greater part of the region the two main elements in the natural vegetation are low xerophilous scrub* and ephemeral grasses which appear in early spring and wither away in summer. The roots and rootlets of both the permanent scrub and the annual vegetation help hold the soil in place. In Jebel Bil'as these types of vegetation are well developed, and the hills are favorite spring pasture grounds for the sheep of peasants and Bedouins. Isolated trees grow in the Palmyrene ranges far to the east throughout the area within the 200-millimeter isohyet, and even just to the east of it, in country believed to have a mean annual rainfall of less than 200 millimeters (7.9 inches). On the northwestern slopes of Jebel Bil'as tree growth is more abundant. Nothing demonstrates better the positive rainfall anomaly of the hills as compared with the arid plains to the north and south.

At the present time the landscape of Jebel Bil'as is at the best parklike, the trees being scattered, except in the valleys, where clumps of three or four grow together. Few trees are taller than 20 feet. The *Pistacia* genus is represented by *P. terebinthus* (probably *P. palaestina*) and *P. vera* (the pistachio tree). The wood of these two trees, hard and slow-burning, is much valued as a fuel. Scrub oak also occurs, and in wadi bottoms thick-leaved evergreens. Shrubs and herbaceous plants are scattered everywhere.

Irrigation

The long summer drought makes irrigation necessary for most crops

* A full account is given by M. Zohary: Geobotanical Analysis of the Syrian Desert, *Palestine Journ. of Botany*, Jerusalem Ser., Vol. 2, 1940, pp. 46-56.

7: Lewis S-5 (ca. 1940–45) 1948 MD1 Syria MD1

ing all this great quantity of Water was past away, so that in about two Hour's Riding we could hardly perceive that there had been any Rain at all.

That floods are an old phenomenon in Selemiya is suggested by two traditional theories, repeated by the inhabitants today, regarding the derivation of the place name. The first theory makes the essential form Sal-Miah, "a flood of water." The other was recorded by Yaqut in 1225:

> Ahmad ibn Yahyâ ibn Jâbir relates that there was a city in Syria, near Salamiyyah, called Al Mûtafikah [The Overturned], which was overwhelmed with all its inhabitants—all except one hundred souls. These left that place, and came and built one hundred houses, and they called the hamlet where they had made their houses Salâm Miyah (Peace for the Hundred), of which the people made Salamiyyah.[12]

As told today, the story is that the "overwhelming" agent was a flood.

The floods are greatly aggravated by soil erosion. Where the trees have been cut, the bushes torn up for fuel, and the grass overgrazed, and especially where slopes have been plowed, there the soil is eroded, and many slopes are now practically bare of soil and vegetation. In summer, soil is shifted by strong winds; in winter, rain washes it into gullies or wadis with steep, crumbling sides. These are tributary to the main streams which do so much damage when they reach the plain. The runoff from bare slopes is faster and more fully loaded than that from vegetated slopes.

Past and Present Vegetation Destruction

There is no doubt that the trees of Jebel Bil'as are a remnant of a denser and more extensive growth, though there are no very good grounds for the common assumption that all the Palmyrene ranges were forested in Roman days. The Tablet of Palmyra's fiscal laws of A.D. 137[13] gives reason to suppose that the locality may have furnished considerable quantities of wood and pistachio nuts, and in the same period Jebel Bil'as and neighboring ranges were used as grazing lands for sheep and horses.[14] The location of elaborate Romano-Byzantine foggara systems, as at Moufaqqar, directly in the paths of the floods might seem to indicate that, when the foggaras were constructed, floods were not as serious as they are now.

Old stumps and roots are found within and beyond the present wooded

---

[12] Le Strange, *op. cit.*, p. 510.

[13] See J.-B. Chabot: Choix d'inscriptions de Palmyre, Paris, 1922, pp. 23–38.

[14] A. Poidebard: La trace de Rome dans le désert de Syrie.—Le limes de Trajan à la conquête arabe.—Recherches aériennes (1925–1932) (Bibliothèque Archéologique et Historique, Vol. 18), Paris, 1934; M. D. Schlumberger: Une campagne de fouilles au Djebel-el-Cheez en 1934, *Comptes Rendus de l'Acad. des Inscriptions et Belles-Lettres*, 1935, pp. 250–256.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

311 most of the region; a scale of 1:10,000 with 2-meter contours for a narrow
654 band running along the Euphrates; and a scale of 1:5,000 with identical contours for the area immediately around the gorge.

5. An area of about 970 square kilometers in the Khabour river valley upstream from Markada.

Aerial photography is already covered by an existing contract. Mapping is necessary to facilitate irrigation planning and to investigate the possibility of a dam at Markada. Mapping on a scale of 1:20,000 with 2-meter contours would be sufficient except for the proposed dam site where the scale would need to be 1:5,000.

6. An area of some 3,400 square kilometers on the left banks of the Khabour and Euphrates rivers.

Mapping of this area on a scale of 1:20,000 with 2-meter contours appears necessary to determine the possibilities of gravity irrigation and to expedite needed soil surveys.

These surveys, which together would cost approximately £S 4 million, would cover most of the land potentially available for cultivation and the greater part of the irrigable area.

Soil Surveys

654 The aerial reconnaissance the mission has suggested would greatly
134 expedite the soil survey already started under the direction of an FAO specialist. Soils can be classified into broad types on the basis of aerial photographs. With additional work on the ground it is possible to proceed to more detailed agrogeological soil mapping, which is necessary to determine how the land already under cultivation can better be employed and how land still unoccupied can best be utilized. This type of mapping is now being undertaken for the Jezireh as an adjunct to the cadastral survey. While all the detailed soil mapping required can obviously not be completed in a few years, the mission urges that the present soil survey be expedited and broadened. A soils department with a budget of £S 60,000 for 1954 has been established in the Ministry of Agriculture. Its budget will have to be raised to at least £S 100,000. The work on soils should concentrate primarily on areas which will or can be opened to settlement such as the Ghab, the Roudj and certain rainfed regions. From

14:International Bank S-5 (1954)1955 MD1 Syria MD1

time to time, however, spot analysis will also be required to carry out special programs to improve soil fertility.

Cadastral Survey

Aerial photography should assist considerably in accelerating the cadastral survey work which was first initiated in 1923 but was still only 45% completed by the beginning of 1953. It is clearly in Syria's interest to finish the cadaster as soon as possible so that the uncertainty surrounding private property rights may be ended at long last and the extent of state domain may be clearly determined. Similarly, it is necessary to expedite the lagging program for converting *mucha'a* or village common land to individual peasant ownership. Experience with the accelerated survey for the Jezireh indicates the need for additional measures to speed up the work. This survey, originally scheduled for completion in the spring of 1955, is now unlikely to be finished before the end of 1956. Insufficient funds, shortages of trained personnel and cumbersome procedures have all contributed to delay this vital survey work. The mission urges that all possible measures to expedite the program be taken. Among the measures that might be considered are the contracting of necessary ground surveys to qualified private firms; the delimitation of properties in certain areas solely by means of aerial photographs rather than by ground surveys; and the possibility of shortcuts in the protracted legal procedures involved in the determination of titles.

State Domain

The aerial, cadastral and soil surveys outlined above will for the first time provide the government with approximately accurate information on the area and quality of state domain. At present the government claims ownership of 1,417,571 hectares of allegedly cultivable land of which 551,473 are leased for cultivation. This total, however, excludes the unoccupied or "dead" land (*mawat*) which was assimilated to state domain by Legislative Decree No. 135 of October 29, 1952. Nor does it include the land which may be "recaptured" by the state under other provisions of the same decree. For instance, this decree specified that prior occupation of land which had not yet been sanctioned by the acquisition of title would be recognized only up to 200 hectares per member of the occupier's

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

heavy clay alluvium in the valley proper and terra rossa and some peat soil along the slopes. Whereas drainage is the main problem in the Ghab, the problem in the Euphrates and Khabour valleys is to extend irrigation so as to double the present cultivated area. The farms vary from rather large holdings of absentee landlords, cultivated by sharecroppers, to very small farm units owned and worked by the farmer himself.

Crop rotation followed in the irrigated area of the Ghab generally takes the form of barley, cotton, wheat and cotton, while the rotation in the Euphrates valley is similar to that in dry farming regions: cotton or summer crop, fallow, winter wheat.

Yields are generally higher than in the rainfed regions but full use is not made of the available water and the irrigation methods are backward in many parts. Though better yielding cash crops have been introduced, the farmer as a rule cultivates only the few traditional crops. In these areas agricultural education could do much to further more economic water utilization and wider crop diversification.

The lands in the immediate vicinity of the rivers are fully irrigated but not fully utilized during the entire year. Hundreds of thousands of hectares on the somewhat higher land on both banks of the Euphrates and in the lower Khabour valley form a potential future reserve, though the capital outlay required to bring them under cultivation would probably have to be furnished by the government.

The central plains of the Syrian desert. In the central plains low rainfall and extreme temperatures render agricultural production practically non-existent but the desert is quite important as a natural grazing area (except during the absolutely dry months) for the sheep and camels of nomadic Bedouin tribes. Many parts of the desert, particularly the large depressions, could be better utilized if desert wells were constructed.

Types of Soil

The soils of Syria rank from the world's best to the poorest roughly in the order of (1) alluvial, (2) black, (3) chestnut brown and terra rossa, followed by (4) brown and reddish brown, and (5) grey sub-desert. According to a preliminary survey conducted by an FAO soil specialist the area covered by each of these various types of soil is approximately as follows (in thousand hectares):

14:International Bank S-5 (1954)1955 MD1 Syria MD1

1. alluvial	200
2. black	100
3. chestnut brown and terra rossa	1,500
4. brown and reddish-brown	3,500
5. grey sub-desert	9,000

The remaining 3.7 million hectares is covered by lithasols, eroded rendzina, and saline soils, which for the greater part have no agricultural significance.

Unfortunately, the three best soil types represent no more than about 10% of Syria's total surface area of about 18 million hectares, and it is on these soils only that a wide variety of crops can be grown. Almost all of the brown and reddish-brown soils, covering 20% of the land area, fall in the inner region of the fertile crescent belt where steppe conditions prevail. These soils are most appropriate for the cultivation of cereals and small grains, and are utilized for such purposes in similar regions throughout the world. The grey sub-desert soils (50%) are used primarily for pasture; crop production is possible only under irrigation.

This evaluation serves only as a rough guide to detailed agrogeological soil maps. A more detailed survey of Syrian soils is in progress and it is imperative that it be continued, since soil maps are essential for planning, and, together with data on climate, may be used to determine the types and quantities of crops which may be cultivated to the greatest economic and social advantage. They would also be of the greatest importance for the assessment of taxes on land holdings, should such a tax be instituted.

Soil Fertility and Agricultural Use

Soil fertility and usefulness depend not only on type but also on profile, that is, the layers or horizons (topsoil and subsoils) of soil materials of various colors, on the chemical composition and on the configuration of the terrain and its water supply.

The depth of profile determines the root rate and the bulk of material available for nutrition, and also indicates the total soil water available—a consideration of importance in view of Syria's semi-arid conditions. Here shallow soils, even the best type, are of limited value only; being more prone to drought than deep ones they are more hazardous as an agricultural base.

Chemical composition of the soil, especially the topsoil, also has an im-

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

portant bearing on fertility, for soils lacking a balance of the main elements (nitrogen, potassium and phosphorus) or deficient in some of the minor elements (calcium, magnesium, etc.) are worthless for agriculture. Nitrogen, the most essential element in plant growth, is extracted from the soil during the growing period. In Syria, the customary method of restoring nitrogen is to leave the land fallow; for centuries this has been done rather successfully in the Hauran and elsewhere. The period of fallow—one, two or three years or more—depends on the type of crop, and, as far as the soil is concerned, the group, quality, depth and restorative capacity. In addition to the customary fallow, Syrian farmers near populated centers use town refuse to restore soil fertility. Unfortunately cheap manure and compost are generally consumed for fuel, but in recent years the use of commercial fertilizers has increased, particularly for cotton and sugar beet. While the Syrian farmers are aware of the importance of better crop rotation practices, improvement of soils through green manuring and leguminous crops is in its infancy.

During the last two decades huge tracts have been opened up, especially in the Jezireh. This land has been idle for centuries and its reserve of chemical compounds caused by decomposition of the natural vegetation is considerable. Though very good soils do exist, particularly in the northeastern parts, the magnitude of the stored elements has generally been overestimated. The reserves, particularly of nitrogen, are not inexhaustible. The virgin soil of the Jezireh has often been compared with virgin soil types in Russia, the United States and Europe but it must be remembered that in Syria the humus has not been so abundant as in humid climates, so that the nitrogen reserve is very limited. When that reserve falls below a certain level soil productivity decreases rapidly even if other elements are in plentiful supply. In Syria continuous exploitation under a monocultural system has resulted in decreased yields in certain areas, notably the Jezireh, where the danger is not yet fully recognized. Even artificial fertilizers cannot replace organic enrichment and the fallow system in its present form is far from sufficient to maintain fertility. New farm techniques, a changed rotation system and increased use of green manuring and fertilizers are urgent needs.

It is believed that Syrian soils are not generally deficient in phosphorus, important for growth and for the forming of grains and seeds, although chemical analyses indicate the total phosphorus available rather than the amount which can actually be absorbed by the plant. Assimilation depends

14:International Bank S-5 (1954)1955 2.ID1 Syria MD1

largely on the acidity of the soil, and the p.H.[3] of practically all Syrian soil is between seven and eight. Most of the phosphorus is blocked. Whereas nitrogen and phosphorus deficiencies can be observed in almost all Syrian crops in various stages, very little indication of potassium shortage has been noted.

Besides the three main elements, the tracer elements iron, manganese, zinc, boron, copper and molybdenum are quite significant. A shortage or lack of one or another can result in low yields, even in soils generally classified as very good. The application of tracer elements e.g., the application of zinc and copper to fiber plants, citrus fruits, etc., has shown remarkable yield increases in other parts of the world. Unfortunately, very few studies of soil fertility and plant growth conditions have been conducted in Syria. Those made by Bracken for winter and summer crops and by Ibrahim Boules for cotton have indicated a general shortage of nitrogen, a disputable lack of phosphorus and rather favorable conditions as regards potassium. The excellent studies and surveys conducted by an FAO soil expert during the last few years have not been sufficiently intensive or extensive so far to form the basis of definite conclusions. But the mission is convinced that a thorough soil survey on the lines already begun by these specialists will be of great assistance in increasing the agricultural area and production. The compilation of the information thus gained, together with data on climate and water resources will be of much value in ensuring a sound rational basis for agricultural planning and development. Aerial mapping is a necessary adjunct to ground surveys and the successful coordination of the undertaking will require the development of a cartographic office.

II CEREALS

Wheat and Barley

Syria is fortunate in being able normally to harvest its wheat and barley approximately one month earlier than American and European cereals; consequently they can be brought on to the European market at the time

[3] p.H. values indicate relative acidity or alkalinity. Values run from 0 to 14, 7 indicating neutrality, numbers less than 7 increasing acidity, and numbers greater than 7 increasing alkalinity.